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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/518,127

07/25/2005

Caiguo Gong

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23455 7590 02/21/2008  
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EXAMINER

PEPITONE, MICHAEL F

ART UNIT

PAPER NUMBER

1796

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/518,127	<b>Applicant(s)</b> GONG ET AL.	
	<b>Examiner</b> MICHAEL PEPITONE	<b>Art Unit</b> 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 October 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-3, 5, 9-12, 14, 16, 19, 20, 22, 23, 28-32, 36-38, 40, 42 and 45 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5, 9-12, 14, 16, 19, 20, 22, 23, 28-32, 36-38, 40, 42 and 45 is/are rejected.
- 7) ☒ Claim(s) 28 and 29 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                        |                                                                   |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>8/29/05</u> .                                                 | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Information Disclosure Statement***

The references (cited pending unpublished US applications) lined through in the Information Disclosure Statement received on August 29, 2005 have not been considered. See 37 CFR 1.98(a)(2)(iii).

### ***Claim Objections***

Claims 28 and 29 and objected to because of the following informalities: Alternative expressions are permitted if they present no uncertainty or ambiguity with respect to the question of scope or clarity of the claims. One acceptable form of alternative expression, which is commonly referred to as a Markush group, recites members as being “selected from the group consisting of A, B and C.” See *Ex parte Markush*, 1925 C.D. 126 (Comm’r Pat. 1925) [See MPEP 2173.05(h)]. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 2-3, 5, 9-12, 14, 16, 19, 20 and 28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 1 and 28: A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered

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indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 1 recites the broad recitation x values form 0 to 20; y values form 0 to 20; z values from 1 to 20, and the claim also recites x values form 1 to 5; y values form 0 to 10; z values from 1 to 5, which is the narrower statement of the range/limitation. Accordingly, dependent claims 2-3, 5, 9-12, 14, 16, 19, 20 are indefinite.

In the present instance, claim 28 recites the broad recitation halides, and the claim also recites bromine and chlorine, which is the narrower statement of the range/limitation.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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Claims 22-23, and 30-32, 36-37, 40, 42, 45 are rejected under 35 U.S.C. 102(b) as being anticipated by Elspass *et al.* (US 5,807,629).

Regarding claims 22-23, and 30-31, and 36: Elspass *et al.* teaches a method for preparing a nanocomposite (1:5-7) comprising contacting clay (2:33-34) with an elastomer comprising copolymers of isobutylene [instant claim 31] and functionalized paramethyl styrene [instant claim 30 and 36] (2:10-17), and grafting a promoter {curing package} (4:4:54-57) [instant claim 22], wherein the elastomer is first contacted with the functionalizing compound (2:18-32), followed by contacting with the clay and melt blended [instant claim 23] (3:10-30; 5:65-6:27).

Regarding claim 32: Elspass *et al.* teaches the basic claimed method [as set forth above with respect to claim 22], wherein the styrene derived units are present in 5.5 wt% (10:49-50).

Regarding claim 37: Elspass *et al.* teaches the basic claimed method [as set forth above with respect to claim 22], wherein the functional groups are present in 1.1 wt% (10:62-65).

Regarding claim 40: Elspass *et al.* teaches the basic claimed method [as set forth above with respect to claim 22], wherein clay is in an amount of 0.1 to 80 wt% of the nanocomposite (3:3-7).

Regarding claim 42: Elspass *et al.* teaches the basic claimed method [as set forth above with respect to claim 22], further comprising carbon black (4:50-51).

Regarding claim 45: Elspass *et al.* teaches the basic claimed method [as set forth above with respect to claim 22], further comprising a secondary rubber {polybutadiene rubber} (3:32-46).

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Claims 22 and 38 are rejected under 35 U.S.C. 102(b) as being anticipated by Li *et al.* (US 6,060,549)

Regarding claims 22 and 38: Li *et al.* teaches a method of preparing a nanocomposite (1:5-6; 8:15-25) comprising contacting clay {treated with an exfoliating agent} [instant claim 38] (6:25-7:10) with an elastomer comprising C<sub>4</sub>-C<sub>7</sub> isoolefins containing functionalized para-alkylstyrenes (2:20-61), and a grafting promoter {curing system} (7:56-8:10) [instant claim 22].

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-3, 5, 9-10, 14, 16, and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Elspass *et al.* (US 5,807,629), in view of Patil (US 5,498,673).

Regarding claims 1-3, 5, and 9-10: Elspass *et al.* teaches a nanocomposite (1:5-7) comprising clay (2:33-34) and an elastomer comprising copolymers of isobutylene [instant claim 5] and functionalized paramethyl styrene [instant claims 2-3, and 9-10] (2:10-17).

Elspass *et al.* does not teach a monomer functionalized with groups (I-V) of instant claim 1. However, Patil teaches copolymers of isoolefins and para-alkylstyrenes (1:5-6) functionalized with an  $R_4$  moiety corresponding to instant groups (I-V)  $\{R^1 = h, x = 2-10, y = 0-20\}$  [instant claim 1] (1:29-2:38). Elspass *et al.* and Patil are combinable because they are concerned with a similar technical difficulty, namely the preparation of copolymers of isoolefins and functionalized para-alkylstyrenes. At the time of invention a person of ordinary skill in the art would have found it obvious to have combined the para-alkylstyrenes functionalized with  $R_4$  groups, as taught by Patil in the invention of Elspass *et al.*, and would have been motivated to do so since Patil suggests that such groups have particular utility in forming polymer blends (1:58-59) and is an equivalent alternative means of providing copolymers of isoolefins and functionalized para-alkylstyrenes.

Regarding claim 14: Elspass *et al.* and Patil renders the basic claimed composition obvious [as set for the above with respect to claim 1], wherein Elspass *et al.* teaches clay in an amount of 0.1 to 80 wt% of the nanocomposite (3:3-7).

Regarding claim 16: Elspass *et al.* and Patil renders the basic claimed composition obvious [as set for the above with respect to claim 1], wherein Elspass *et al.* teaches carbon black (4:50-51).

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Regarding claim 19: Elspass *et al.* and Patil renders the basic claimed composition obvious [as set for the above with respect to claim 1], wherein Elspass *et al.* teaches a secondary rubber {polybutadiene rubber} (3:32-46).

Regarding claim 20: Elspass *et al.* and Patil renders the basic claimed composition obvious [as set for the above with respect to claim 1], wherein Elspass *et al.* teaches an inner tube (3:29-31).

Claims 1 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li *et al.* (US 6,060,549) in view of Patil (US 5,498,673).

Regarding claims 1 and 11-12: Li *et al.* teaches a nanocomposite(1:5-6) comprising clay treated with an exfoliating agent [instant claim 12] (6:25-7:10) and an elastomer comprising C<sub>4</sub>-C<sub>7</sub> isoolefins containing up to about 20 mol% [instant claim 11] of functionalized para-alkylstyrenes (2:20-61).

Li *et al.* does not teach a monomer functionalized with groups (I-V) of instant claim 1. However, Patil teaches copolymers of isoolefins and para-alkylstyrenes (1:5-6) functionalized with an R<sub>4</sub> moiety corresponding to instant groups (I-V) {R<sup>1</sup> = h, x = 2-10, y = 0-20} [instant claim 1] (1:29-2:38). Li *et al.* and Patil are combinable because they are concerned with a similar technical difficulty, namely the preparation of copolymers of isoolefins and functionalized para-alkylstyrenes. At the time of invention a person of ordinary skill in the art would have found it obvious to have combined the para-alkylstyrenes functionalized with R<sub>4</sub> groups, as taught by Patil in the invention of Li *et al.*, and would have been motivated to do so since Patil suggests that such groups have particular utility in forming polymer blends (1:58-59)



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and is an equivalent alternative means of providing copolymers of isoolefins and functionalized para-alkylstyrenes.

Claims 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Elspass *et al.* (US 5,807,629) as applied to claim 22 above, in further view of Patil (US 5,498,673).

Regarding claims 28-29: Elspass *et al.* teaches the basic claimed method [as set forth above with respect to claim 22].

Elspass *et al.* does not teach a method utilizing the functionalizing compounds listed in instant claims 28 and 29. However, Patil teaches copolymers of isoolefins and para-alkylstyrenes (1:5-6) functionalized with anhydrides, acylhalide, or lactones, specifically acetyl chloride [instant claim 28] and maleic anhydride [instant claim 29] (1:29-2:38). Elspass *et al.* and Patil are combinable because they are concerned with a similar technical difficulty, namely the preparation of copolymers of isoolefins and functionalized para-alkylstyrenes. At the time of invention a person of ordinary skill in the art would have found it obvious to have combined the functionalizing compounds {yielding R<sub>4</sub> groups}, as taught by Patil in the invention of Elspass *et al.*, and would have been motivated to do so since Patil suggests that such functionalizing compounds {yielding R<sub>4</sub> groups} have particular utility in forming polymer blends (1:58-59) and is an equivalent alternative means of providing copolymers of isoolefins and functionalized para-alkylstyrenes.

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or

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improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-3,5,9-12,14,16,19,20,22,23,28-32,36-38,40,42 and 45 provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-3, 5-6, 9-11, 13-16, 19-21, 22-24, 28-32, 35-37, 39-42, 45-50, 52-53, 55-56, 59-61, 63-66, 69-71 of copending Application No. 10/518,193. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claimed compositions and methods substantially overlap in scope. The instant application utilizes Friedel-Crafts protocol to append functionalized groups (I-V) to the elastomer, whereas ‘193 uses a radical mechanism for modification of the elastomer which results in addition  $\alpha$  to the carbonyl. The regioisomers are obvious variants of each other, and the result of each process yields a functionalized elastomer composition having carboxylic groups capable of interacting with clay.

This is a provisional obviousness-type double patenting rejection.

The prior art made of record and not relied upon is considered pertinent to applicants' disclosure. See attached form PTO-892.

### ***Correspondence***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL PEPITONE whose telephone number is (571)270-3299. The examiner can normally be reached on M-F, 7:30-5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Eashoo can be reached on 571-272-1197. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark Eashoo/  
Supervisory Patent Examiner, Art Unit 1796  
February 15, 2008

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